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1. A)

|  |  |  |  |
| --- | --- | --- | --- |
| Stack | Buffer | New Dependency | Transition |
| [ROOT] | [Nadia, rode, the, donkey, with, dexterity] |  | Initial Config |
| [ROOT, Nadia] | [rode, the, old, donkey, with, dexterity] |  | SHIFT |
| [ROOT, Nadia, rode] | [the, old, donkey, with, dexterity] |  | SHIFT |
| [ROOT, rode] | [the, old, donkey, with, dexterity] | rode Nadia | LEFT-ARC |
| [ROOT, rode, the] | [old, donkey, with, dexterity] |  | SHIFT |
| [ROOT, rode, the, old] | [donkey, with, dexterity] |  | SHIFT |
| [ROOT, rode, the, old, donkey] | [with, dexterity] |  | SHIFT |
| [ROOT, rode, the, donkey] | [with, dexterity] | donkey old | LEFT-ARC |
| [ROOT, rode, donkey] | [with, dexterity] | donkey the | LEFT-ARC |
| [ROOT, rode] | [with, dexterity] | rode donkey | RIGHT-ARC |
| [ROOT, rode, with] | [dexterity] |  | SHIFT |
| [ROOT, rode, with, dexterity] | [] |  | SHIFT |
| [ROOT, rode, with] | [] | with dexterity | RIGHT-ARC |
| [ROOT, rode] | [] | rode with | RIGHT-ARC |
| [ROOT] | [] | ROOT rode | RIGHT-ARC |

B) It will be parsed in 2n + 1 steps. It will take one step for each word to be added to the stack, and then another step to be reduced. There is also one extra step for initializing the ROOT in the first step.

C) Since LEFT-ARC and RIGHT-ARC are only capable of handling the last item and the second last item on the stack, and non-projective dependency trees shown as the example will require the last item and the third last item on the stack to be handled.